watered by the Kyzyl-su River, is covered with luxurious Alpine pasturage, and therefore becomes in summer the feeding ground for immense herds of cattle belonging to the Fergana, Kashgar, Shungan, and Karateghin Kirghizes. A sandy cleft, Tash-kurgan, leads from the Alai Valley to the Pamir Highlands. After a journey of forty-five miles along this cleft, and after having crossed the Kyzyl-art Pass, 14,017 feet high, M. Korostovtseff reached the salt-lake, Kara-kul, twenty-seven miles long and twelve miles wide, 13,194 feet above the sea-level. Its sandy banks are quite bare, and the surrounding stony hills bear no traces of vegetation; it is only close by the deep-blue waters of the lake that the traveller discovers here and there a low and dry bush. Thence M. Korostovtseff turned south-east, entered the cleft Alabaital, and reached, by a gentle slope, the pass of the same name, 15,314 feet high, whence he had to descend on the very steep southern slope, to the valley of the Chan-su River, quite bare and covered with snow-white deposits of salt. The valley of a rivulet, Uz-bel, tributary of Chansu—a sandy desert twenty miles long—and the Uz-bel Pass, 15,195 feet high, were followed east to reach the valley of Sary-kol, 14,300 feet above the sea-level, and covered with a very scarce vegetation; here some small rivulets give rise to the Kashgar-daria River. Thus the general characters of the northern part of the Pamir table-land are high valleys, flat, open, bare, and sandy, never descending below some 13,000 feet, with blue salt lakes and salt deposits on their dry bottom; relatively low mountains, the passes between which are only some 1,000 or 2,000 feet above the bottom of the valleys, the peaks being covered with perpetual snow when they exceed an altitude of 15,000 or 16,000 feet; no inhabitants, and a very scarce vegetation. Such is the hitherto mysterious "roof of the world" (Pamir). From Sary-kol M. Korostovtseff was compelled to return. He died a short time after his return, without being able to publish the results of his most interesting journey or describe the valuable collections he obtained.

THE "NERTHUS" OF TACITUS.—Dr. Michelsen, of Schleswig, has just published a pamphlet in which he discusses that remarkable and often-mentioned Nerthus-island, which, according to the description of Tacitus, with its sacred lake and forest, formed the centre of a divine service of seven closely connected communities. Formerly the island of Rügen, or the so-called "Land Oldenburg," was thought to be the island in question. Dr. Michelsen, however, points out that the island of Alsen is the one meant by Tacitus. He states that the name signifies "sanctuary" or "temple-island," and that the sacred lake and forest still exist in the north-west of Norburg on the Alsensund, under the names of "Hellewith and Hellesö" (*heilige Wald und heilige See*—holy wood and holy sea). The inhabitants of that district still call the village of Hellewith, situated near the forest, Hellod (*heiliges Eigen*—holy own); and in the existing remains of the old forest there is a well-preserved sacrificial altar consisting of enormous blocks of granite. Dr. Michelsen gives a number of other interesting proofs for the correctness of his conjecture, and also remarks that he has partly discovered the names of the seven Nerthus people in villages of the Sundewitt district.

VENEZUELA.—In the January session of the Berlin Geographical Society, Dr. Sachs gave a description of his recent journey to Venezuela, for the purpose of studying the gymnotus in its native haunts. Humboldt's sketch of the Llanos was completed and corrected in some points. This great plain, formerly an inland sea, is 600 feet above the sea in its upper part, and but 200 in its lower part, a difference which accounts for the fact that the grass, but 1 to 2 feet in height in the upper portion, rises above the head of the river in the lower region. The decrease in the number of cattle on the Llanos of late years has led to a rapid extension of the arboreal growth. The Llaneros are a peculiar people, arising from a mixture of the white, red, and black races, and standing on a low grade of civilisation, their religion consisting in the adoration of a few saints, and marriages being rare. Humboldt's familiar description of the capture of the electric eel, by driving horses into the streams frequented by it, as the customary method in the land, is regarded as resting on an error. No one in the region was acquainted with it, and it was found impracticable to carry out. The scientific results of Dr. Sach's observations will be published shortly.

THE INDUS.—The course of the Indus river from the point where it leaves Cashmere down to where it enters English territory, about 120 miles below Darband, has recently been explored in detail by a Punjaub surveyor, and our geographical knowledge of the river has thus been considerably augmented, while valuable topographical material has been obtained. Of course Capt. Carter had previously determined, in a general way, the course of the river in the districts named, by his trigonometrical measurements of the heights of the mountain summits on both banks of the Indus.

NEW GUINEA.—Dr. E. T. Hamy, in the just issued November part of the *Bulletin* of the Paris Geographical Society, describes in considerable detail the results of his examination of an old map of New Guinea, for the purpose of showing how much had been done for its discovery by the Spanish navigators of the sixteenth and seventeenth centuries (1528–1606). The map, which serves as the basis of Dr. Hamy's paper, is contained in the atlas of Pierre Martier, published at Amsterdam in 1700. The data for this and other maps in the atlas had been collected by Frémont d'Ablancourt while in Portugal, and the many names on New Guinea would show that by the sixteenth century its coasts had been pretty well explored all round, though its shape is very inaccurately laid down.

NOTES

WE give some account to-day of the life and work of the late M. Becquerel, and next week we hope to do the same for M. Regnault, who died two days after M. Becquerel, in his 68th year. M. Victor Regnault was born at Aix-la-Chapelle, in 1810. He was Professor of Physics in the College of France, and of Chemistry in the Polytechnic School; he also held for some time the Directorship of the Porcelain Manufactory of Sèvres. His researches in the several branches of physics and chemistry published in the *Memoirs* of the French Academy of Sciences, and many other scientific journals, are numerous, and of the greatest value. Of these perhaps his publications on the expansion of elastic fluids, the determination of the densities of gases, the measurement of temperatures, and the determinations of the specific heats of liquids, solids, and gases, are the most important, and have brought his name most prominently before the world. He has also written many valuable papers on physiological questions. M. Regnault was elected a member of the Academy of Sciences in 1840, and in 1850 was created an officer of the Legion of Honour.

THE Council of the Royal Society of Edinburgh have awarded the Neill medal to Dr. Ramsay Traquair, for his paper on the Structure and Affinities of *Tristichopteris alatus*, Egerton, being one of an important series of contributions to the knowledge of the structure of recent and fossil fishes.

WE are informed that the Pennsylvania Railway Company are disposed to grant very favourable terms to any European astronomers who, in their private capacity, may wish to go to America to observe the approaching eclipse of the sun. It is stated that for less than half the usual fares astronomers will be conveyed from New York, Washington, or Baltimore to Denver. We

hope, however, to be able in an early number to publish definite information on the matter.

THE German Military Department, always on the watch to make use of the latest scientific discoveries, has naturally devoted its attention at once to the telephone. In the last number of the *Militair Wochenblatt* we notice a report on the practicability of its use in warfare, for maintaining communication with pickets and outlying posts. The experiments were carried out at a temperature of $-3°$ C., and during a violent wind, and showed most conclusively its availability for the purposes in question.

IT is gratifying to know that at last Cleopatra's Needle has safely reached the Thames. It is proposed to moor the ingeniously-constructed vessel containing the obelisk at a convenient part of the Thames embankment for some days, to enable the public to inspect it.

THE lately formed society for the protection of the interests of chemical manufactures in Germany, begins with the present year the publication, at Berlin, of a monthly organ entitled *Die chemische Industrie*, under the editorship of Dr. Emil Jacobsen. It is intended to make it a complete record of everything of interest in the department of technical chemistry.

THE Academy of Sciences will hold its anniversary meeting next Monday, when M. Bertrand will deliver an *éloge* of Lame, a member of the Academy of Sciences and a physicist, who died twenty years ago. He had travelled in Russia like Becquerel, but not as an officer belonging to an invading force. He had been appointed by the Russian Government to establish the Military School of Odessa.

THE second part of Signor Mantegazza's studies on the Ethnology of New Guinea is published in the December number of his *Archivio*, illustrated by a number of plates.

A GEOGRAPHICAL Society has been formed at Metz, based on the model of those in other German cities.

THE German Patent Office reports that it has received during the past year 6,424 applications, a larger number than any other country can boast of except the United States.

THE Association for the Improvement of Geometrical Teaching held its annual meeting at University College, Gower Street, on Friday, January 11, and at this meeting, in addition to proceeding with the work already taken in hand, it was resolved that sub-committees should be appointed to draw up syllabuses of solid geometry and of higher plane geometry, and also that the Association should take into consideration the subject of geometrical conics, with a view to expressing its opinion on the best order of teaching it. The president (Dr. Hirst, F.R.S.) delivered an address, and subsequently tendered his resignation of the presidentship on the ground of the pressing nature of his other duties; the Rev. E. F. MacCarthy, one of the secretaries, also was obliged, for a like reason, to resign his office. The vacancies were filled up by the election of Mr. R. B. Hayward, F.R.S., as president, and of Mr. R. Tucker as secretary (in conjunction with Mr. R. Levett, the principal originator of the movement). Mr. J. M. Wilson and Dr. Jones were re-elected vice-presidents. Mr. H. C. Watson, Clifton College, was elected Treasurer in the room of Mr. H. Weston Eve.

IT appears that beer is adulterated to a great extent with glycerin. An easy and exact method of its determination in this connection is wanting, and a prize of 3,000 marks has been offered by the *Verein für deutschen Gewerbfleiss* for the best solution of this problem.

THE *Deutsche ornithologische Gesellschaft* was lately requested by the Chancellor of the Empire to express its opinion on a proposed law for the protection of birds. A duly appointed commission under the presidency of Dr. Brehm, has recently presented a report on this subject, in which the contemplated law is regarded as unnecessary. There is at present, according to their information, no general diminution in the number of useful birds, and where a local disappearance has been observed, it is to be traced to the present development of the agriculture and forestry of the land, and is not due to the direct attempts of man.

THE German botanist, Regel, has discovered in the Himalayas a variety of wild onion, which he regards as the original source of our ordinary garden onion. It is called *Allium cepa sylvestre*.

BERLIN is becoming the centre of an extensive system of subterranean telegraphic lines radiating in various directions. Cables have been already laid, or are in process of being laid, on the routes Berlin-Cologne, Berlin-Frankfort, Berlin-Strassburg, Berlin-Breslau, Berlin-Königsberg, and Berlin-Hamburg and Kiel. As a glance at the map will show, the military element plays an important part in the selection of these routes. Most of the lines are buried alongside the substantial roadways which traverse the empire. The work of excavation is carried on rapidly by means of enormous portable engines which dig a trench one metre in depth and half a metre broad, lay in it the cables (generally two in number, containing each seven wires), and cover them by a continuous movement.

A DOG-FISH became entangled in the net of some French fishermen near Cape Agde lately, and after having dragged their boat about during the entire night at the rate of twelve miles an hour, was finally captured and brought to land. It measured over sixteen feet in length and weighed about 2,500 lbs. Its enormous stomach contained the head, feet, and several other portions of a mule, as well as two half-digested tunny-fish.

WE notice in the last number of the *Journal* of the Russian Chemical and Physical Societies (vol. ix. No. 9), two interesting chemical papers by M. Eltekoff, on the regularity of elimination of the elements of the haloid-hydric acids from chlorates of hydro-carbonates, and on the structure of different amylenes which are found in the amylene supplied by trade.

PROF. C. HERMANAUZ, of Vienna, died recently in Japan, while engaged on a voyage round the world, chiefly for the purpose of agricultural observation.

FEW national scientific associations have grown so rapidly as the French Association for the Advancement of Science. Although but in its seventh year, we notice from the recently issued report of the secretary that the number of the members is already nearly 2,400. In this short time the association has accumulated a capital of 223,000 francs, and has granted 26,000 francs to various scientific objects. Each member pays annually 20 francs, and receives a handsome copy of the report. The last issued (for the Session of 1876) forms a bulky volume of 1,200 pages, illustrated by seventeen well-executed plates. According to the statutes, Paris is excluded from the place of session, on much the same ground that London is never chosen by the British Association. The present year forms, however, an exception, on account of the Exhibition, and Paris will welcome the Association far the first time.

IN the eighth number of the *Journal* of the Russian Chemical Society is a paper by Prof. Meorshutkin on the influence of isomerism on the formation of ethers between acids and alcohols (NATURE, vol. xvii. p. 151) (also published separately in French); a note by M. Ziloff, on the influence of the medium on the electro-dynamical induction; a paper by M. Borgmann, on thermo-electricity; and a note by M. Kraevich, on his new portable barometer, which is intended to avoid the usual boiling of mercury in barometrical tubes, and was highly approved some

time ago by officers of the Russian general staff, who have had the opportunity of making use of it on travels.

M. CHIKOLEFF, who has made, at St. Petersburg, several experiments on electrical lights, by order of the Ministry of War, confirms, in the ninth number of the *Journal* of the Russian Chemical and Physical Societies, the results of the experiments of Tyndall. He observes also, that a galvano-plastic copper coating of the carbon proves to be very useful.

AT a recent lecture held at the Rudolphinum, at Vienna, before a large audience, Dr. E. Lewy proved that the human skin is completely impenetrable for the chemical contents of mineral waters, and that therefore the explanation of the effects of baths in these waters, at the numerous bathing-places, has to be sought exclusively in the domain of physics and not in that of chemistry. This important discovery annuls all common views regarding the bathing cures effected by the various mineral springs, and explains in the simplest manner that, from a chemical point of view, the action of the most different waters must be one and the same.

THE French Government has recently appointed a mixed commission of leading scientific men and engineers for the purpose of making a thorough examination into the best means of preventing the explosions of firedamp in coal-pits. Among its members are MM. Daubrée, Berthelot, Thénard, and Hébert, of the Academy of Sciences, Professors Fert, Burat, Haton de la Goupillière, Fouqué, and other well-known names. Although the French mines have suffered comparatively little in this direction, the terrible disasters in our English mines have taught the necessity of throwing about the miner's dangerous occupation the utmost safeguards at the command of modern science, and an active and thorough programme is being prepared by the Commission.

A REQUISITION has been sent to the French Ministry by the Société de Physique, asking that it should be incorporated, or "reconnue comme d'utilité publique." It is stated that a favourable reply may be expected from M. Bardoux.

AT a recent meeting of the French Physical Society, M. Duter presented magnets obtained by subjecting circular steel plates to the action of an electro-magnet terminated with a conical point applied to the centre of the disc. In these magnets the neutral line is a concentric circle of the disc, with radius $\frac{R}{\sqrt{2}}$. To study the free magnetism distributed over them, M. Duter used a small soft iron cylinder (a few centigrammes in weight), fixed in the centre to the rod of an areometer floating in water. The force of detachment of this was estimated by the weight of water which had to be let off from the cylindrical vessel containing the areometer before the contact was detached. The precise instant of contact and detachment was indicated by an electric signal. M. Duter thus demonstrated experimentally that the quantities of free austral and boreal magnetism were equal in the two portions (of contrary name) in the same plate. He sought to represent by an empiric formula, the results relative to forces of detachment for plates of different diameter. These forces depend simply on one specific coefficient variable with the nature of the steel and with the thickness.

THE influence on the animal organism of breathing pure oxygen gas of density corresponding to ordinary atmospheric pressure, has not hitherto been adequately determined. The Royal Society of Göttingen, therefore, offer a prize for new researches on the subject, made both on homoiothermal, and, as far as possible, on poikilothermal animals; in these researches, while certain externally visible phenomena in the animal will have to be considered, special attention is desired to be given to the nature of the blood and the exchange of material (excretion of carbonic acid, and nature of urine). The oxygen used should be carefully freed from all foreign matters apt to occur in manufacture; while a limited (and perhaps hardly avoidable) admixture of atmospheric nitrogen would not compromise the results. In the mathematical class, the Göttingen society desires (and offers a prize for) new researches on the nature of the unpolarised light-ray, "fitted to bring the conceptions of natural light of any origin, near (in definiteness) to those which theory connects with the various kinds of polarised light." (For further particulars see the Society's *Nachrichten*, No. 26, 1877.)

HITHERTO water has been regarded as possessing a greater specific heat than any other body, with the exception of hydrogen. In a recent session of the Vienna Academy M. E. Lecher communicated the results of experiments showing that in this respect water alone is surpassed by various mixtures of methylic alcohol and water, which will accordingly take the second position in regard to hydrogen.

THE Report of the Berlin Academy of Sciences for September and October, which has just appeared, contains, among other papers, "Comparison of the Tidal Heights in the East Sea from 1846–1875," by H. Hagen; "Anatomy of the Appendicularia," by Prof. Virchow and H. Langerhaus; "Atomic Weight of Molybdenum," by Prof. Rammelsberg; "Movement of the Electricity in Submarine and Subterranean Telegraphic Wires," by Prof. Kirchhoff; and "Catalogue of the Fishes and Amphibia from Chinchoxo (Africa), presented to the Berlin Zoological Museum by the *Afrikanische Gesellschaft*," by Prof. Peters.

THE electromotive force produced by the flow of water through capillary tubes has lately been investigated both by M. Haga at Strassburg University, and by Mr. J. W. Clark at Heidelberg (*Pogg. Ann.*, No. 11, 1877). Both observers used a quadrant electrometer instead of a galvanometer (as in former experiments with diaphragms and capillary tubes) to measure the difference of potential. This difference, according to M. Haga, is proportional to the pressure, independent of the length of the tubes, dependent on the nature of the inner surface of the tubes, increases with the resistance of the water, and probably also with the temperature. Mr. Clark finds (1) that the narrower the tube the greater is the electromotive force when liquids are forced through. (2) In very narrow tubes the electromotive force is independent of the length; in wider tubes it decreases with the length. (3) If the inner tube-surface be coated with different substances, different electromotive forces are obtained, whose amounts entirely agree with Quincke's former results with regard to diaphragm currents. (4) The electromotive force decreases with the time; and this whether still water or flowing water occupy the tube between the experiments. If the tube be cleaned anew with sulphuric acid and distilled water, the original electromotive force is re-established. (5) The seat of the electromotive force is the limiting surface of the liquid and the solid tube-wall.

THE Russian newspaper published in Turkestan reports that the scientific explorations in the Semirechensk District were continued uninterruptedly during the year 1877. Special attention was bestowed upon the investigation of the line of coral reefs which remained from the prehistoric Central Asian Sea. This line extends from the Dalashik Mountains over the Tuluk Tau and Temirlik Tau, and further eastward as far as the frontier of the Kuldsha District. Large quantities of the finest corals and beds of fresh-water shells were found; marine shells were discovered only in small quantities. The silurian formation of these districts may now be considered as proved beyond doubt.

THE new ethnological museum opened at the Hôtel des Invalides, Paris, contains a collection of warriors belonging to several nations and tribes, civilised and uncivilised. These models

have been executed in an artistic manner and give a clear idea of the variety of destructive agencies resorted to by mankind for warlike purposes.

We have received a useful little manual of dates, "Drury's Chronology at a Glance" (Hardwicke and Bogue), containing much well-packed information. In the next edition the author should omit all expression of opinion on events and men, and utilise the space for additional information.

In the January number of Petermann's *Mittheilungen*, Dr. Mohn describes in detail the results as to soundings and temperatures of the Norwegian North Sea Expedition of 1876. Dr. Oscar Drude has an important article on the geographical distribution of palms, and a detailed programme is given of the new expedition of Gerhard Rohlfs, to which we referred last week. A brief sketch is given of the ten-years' exploration in South America of Doctors Reiss and Stübel, some of the results of which have appeared at various times in *Globus* and elsewhere, but the full details of which will necessarily take some time to publish.

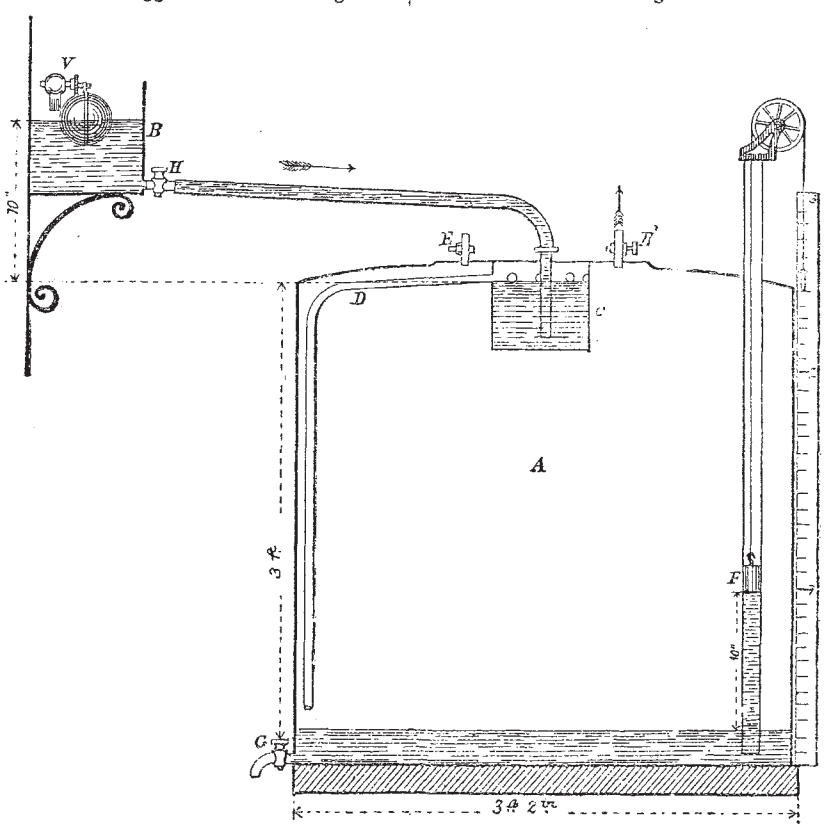
Dr. Radde, in a letter from Tiflis to Dr. Petermann, speaks of the brothers Brotheus, from Helsingfors and Wasa, who spen last summer in botanising in the Caucasus, taking back with them a varied collection of mosses and a rich herbarium of phanerogams.

The additions to the Zoological Society's Gardens during the past week include a Javan Chevrotain (*Tragulus javanicus*), a Stanleyan Chevrotain (*Tragulus stanleyanus*), from Java, pre sented by Mrs. Leslie Walker; a Grivet Monkey (*Cercopithecus griseo-viridis*) from North-East Africa, presented by Madame Patey; an Arabian Gazelle (*Gazella arabica*) from Arabia, presented by Mr. Mark Whyley; three Summer Ducks (*Aix sponsa*) from North America, presented by Lord Braybrooke; two Mandarin Ducks (*Aix galericulata*) from China, two White-bellied Storks (*Abdimia sphenorhyncha*) from West Africa, purchased; two Silky Cow Birds (*Molothrus bonariensis*) from South America, a Superb Tanager (*Calliste fastuosa*), two Violet Tanagers (*Euphonia violacea*) from Brazil, deposited.

NEW FORM OF GAS-HOLDER

Having found the necessity of a gas-holder which should yield a steady flow of gas and be under control from the lecture-room, at some distance from the only available spot where the gas-holder could be placed, I devised the following plan, which was carried out for me by Mr. Yeates, to whom I am indebted for one or two excellent suggestions. The arrangement is, I believe, novel, it is inexpensive, and it answers admirably; it may, therefore, be of convenience to put before some of your readers the following sketch, which needs but little explanation:—

A is a bell-shaped, gas-tight holder of galvanised iron or stout zinc. B is a water-supply cistern with adjustible ball-cock valve, in fact, an ordinary kitchen boiler supply-cistern, in connection with the water-main through V. C is a small reservoir fixed to



the dome of the gas-holder; when filled, once for all, the water overflows into the holder; to avoid splashing it is better to convey a pipe, D, near to the bottom of the holder. The water-pipe from the cistern, B, passes air-tight into the gas-holder, and is furnished with a cock, H, to shut off the pressure when necessary. The pressure on the gas within the holder obviously depends on the difference of the water-level in the cisterns B and C. To give a brilliant lime-light some ten inches head of water is required. This corresponds to about 2 cwt. on the usual wedge-shaped gas-bag. To give a sensitive flame with a steatite gas-jet having an orifice the size of No. 19 wire, B W G (0·04 inch diameter), a pressure of some nine inches of water is required. The depth of the cistern, B, allows the ball-float a range of adjustment, and hence of gas-pressure, of some six inches.